



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,664	05/03/2005	Harald Rohde	2002P17862WOUS	6222
29177	7590	03/03/2008	EXAMINER	
BELL, BOYD & LLOYD, LLP			LAMB, CODY W	
P.O. BOX 1135			ART UNIT	PAPER NUMBER
CHICAGO, IL 60690			2613	
			MAIL DATE	DELIVERY MODE
			03/03/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/533,664	ROHDE, HARALD
	Examiner	Art Unit
	Cody W. Lamb	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 02 January 2008.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 8-14, 18 and 23-27 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 8-14, 18 and 23-27 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
 5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

Response to Amendment

1. Claims 8 and 14 have been amended, with claims 8 and 13 being independent. Claims 8-14, 18 and 23-27 are pending in the application while claims 15-17 and 19-22 have been cancelled. No new claims have been added.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Winston Way et al. (US Patent Application Publication No. 2002/0030877), referred herein as Way.

Regarding claim 23, Way teaches a receiver comprising an optical resonator fed by an angle-modulated (known to be phase-modulated) signal (figure 10, item 218 and

paragraph 77), an optical uncoupling mechanism upstream of the optical resonator for light reflected from the optical resonator (circulator, paragraph 77), an opto-electric converter downstream of the optical uncoupling mechanism (figure 11, item 232), wherein the resonator has a resonance frequency centered at the light frequency and is transmitted or reflected based on the phase modulation (paragraph 77).

Regarding claim 24, Way teaches the limitations of claim 23. Way also teaches an embodiment where the optical resonator is a Fabry-Perot resonator (paragraph 77).

Regarding claim 25, Way teaches the limitations of claim 23. Way also teaches using a circulator for the coupling-out device preceding the resonator (paragraph 77) where the output of the circulator is connected to the opto-electric transducer (paragraph 83)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8-11, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Way in view of Bruce Napier et al. (US Patent No. 6,771,910), referred herein as Napier.

Regarding claim 8, Way teaches a receiver for an angle-modulated optical signal having an associated light frequency and an associated bit rate (paragraph 62 teaches channels with a bit rate and paragraph 54 teaches signals with an associated frequency), comprising: an optical resonator tuned to the frequency of the optical signal (paragraph 77 teaches an optical resonator in the form of a bandpass filter that reflects some wavelengths of light and transmits other wavelengths); an optical coupling-out device preceding the optical resonator and designed for injecting the optical signal into the optical resonator and for coupling out reflected light from the optical resonator (paragraph 77 teaches a circulator which transmits light sent to the resonator and couples out light reflected from it); and an opto-electrical transducer receiving the reflected light and converting it into an electrical signal (figure 11, items 232 and 236 teach photo-detectors which are devices that convert optical signals to electrical signals). However, Way does not teach the resonator as having a storage time of half a bit duration. It is a known practice to use resonators to delay a signal by half a bit length. For example, Napier teaches lagging bit streams by one half a bit period (column 5, lines 6-9 teach delaying a signal by half a bit period). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Way with the half bit period delay of Napier for interleaving bit streams (column 5, lines 5-6 teach this advantage).

Regarding claim 9, Way and Napier teach the limitations of claim 8. Way further teaches a receiver wherein the optical resonator is a Fabry-Perot resonator (paragraph 77 teaches a Fabry-Perot cavity resonator).

Regarding claim 10, Way and Napier teach the limitations of claim 8. Way further teaches a receiver wherein the optical coupling-out device comprises a circulator connected preceding the optical resonator and whose output is connected to the opto-electric transducer (paragraph 77 teaches a circulator with an output 1 connected to a photodiode, or electro-optic transducer, the connection being shown in figure 10, item 2).

Regarding claim 11, Way and Napier teach the limitations of claim 9. Way further teaches a receiver wherein the optical coupling-out device comprises a circulator connected preceding the optical resonator and whose output is connected to the opto-electric transducer.

Regarding claim 14, Way and Napier teach the limitations of claim 8. Way further teaches a receiver wherein a second opto-electric transducer is arranged downstream of the optical resonator receiving non-reflected light (figure 10, signal 3 at item 228 illustrates a signal path of non-reflected light and figure 11, item 232 and paragraph 83 teach a detector for the light at item 228) and outputting a complementary signal to increase the sensitivity of the receiver (it is inherent that if one detector is set for reflected light and the other is set for non-reflected light, the signals will be complementary).

Regarding claim 18, Way and Napier teach the limitations of claim 8. Way further teaches a receiver comprising a coding for assigning a phase variation by the light reflected and as the case may be transmitted by the optical resonator (paragraph

77 teaches assigning phase modulation by a Mach-Zehnder interferometer to optical transmission through or reflection from, the resonator).

6. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Way and Napier as applied to claims 8 and 9 above, and further in view of Edward Gabl et al. (US Patent No. 5,592,327), referred herein as Gabl.

Regarding claim 12, Way and Napier teach the limitations of claim 8. However, they do not teach a receiver wherein the optical coupling-out device comprises a polarization beam splitter with a following polarization plate so that the angle-modulated optical signal and the reflected light have different polarizations which can be separated by the polarization beam splitter. Gabl teaches a system wherein an optical coupling-out device comprises a polarization beam splitter (figure 2, item 16 teaches the polarization beam splitter) with a following polarization plate so that the angle-modulated optical signal and the reflected light have different polarizations which can be separated by the polarization beam splitter (figure 2, item 17 and column 7, lines 8-16 teach a polarization rotator for rotating the polarization and coupling the light out of the system). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Way and Napier with the coupling apparatus of Gabl in order to selectively eject certain amplified ultrashort pulses of a given polarization from a cavity (column 7, lines 4-21 teach this advantage).

Regarding claim 13, Way and Napier teach the limitations of claim 9. However, they do not teach a receiver wherein the optical coupling-out device comprises a polarization beam splitter with a following polarization plate so that the angle-modulated

optical signal and the reflected light have different polarizations which can be separated by the polarization beam splitter. Gabl teaches a system wherein an optical coupling-out device comprises a polarization beam splitter (figure 2, item 16 teaches the polarization beam splitter) with a following polarization plate so that the angle-modulated optical signal and the reflected light have different polarizations which can be separated by the polarization beam splitter (figure 2, item 17 and column 7, lines 8-16 teach a polarization rotator for rotating the polarization and coupling the light out of the system). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Way and Napier with the coupling apparatus of Gabl in order to selectively eject certain amplified ultrashort pulses of a given polarization from a cavity (column 7, lines 4-21 teach this advantage).

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Way as applied to claim 23 above, and further in view of Gabl.

Regarding claim 26, Way teaches the limitations of claim 23. However, Way does not teach a polarization beam splitter with a polarization plate for separating the optical signal and reflected light that have different polarizations after passing through the plate. Gabl teaches a system where a polarization beam splitter is used to couple out reflected light (figure 2, item 16), and a polarization plate is used to rotate reflected light so that its polarization is different from the input signal (figure 2, item 17 and column 7, lines 8-16). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Gabl with the

teaching of Way in order to selectively eject certain amplified ultrashort pulses of a given polarization from the gain medium of a laser cavity (column 7, lines 4-21).

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Way as applied to claim 23 above, and further in view of Hiroshi Onaka et al. (US Patent No. 5,469,288), referred herein as Onaka.

Regarding claim 27, Way teaches the limitations of claim 23. However, Way does not teach a second opto-electric transducer following the optical resonator for increasing sensitivity. Onaka teaches an apparatus where a second opto-electric transducer follows a Fabry-Perot filter (figure 21 and column 17, lines 41-45). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Way with the teaching of Onaka for stopping waveform sweeping when a light signal has arrived (column 17, lines 54-57).

Response to Arguments

9. Applicant's arguments filed 01/02/2008 have been fully considered but they are not persuasive.

10. In response to applicant's argument that Way discloses a single sideband modulator and not an optical receiver (page 5, lines 8-10), a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it

meets the claim. In this case, the transmitter is illustrated in figure 10, item 104, and all remaining parts after this are used for receiving the signal while still meeting the claim limitations (for instance, figure 11 illustrates the receiver's detection methods with the photodetectors where the photodetector that receives the signal is dependent upon reflection from, or transmission through, a wavelength-selective resonator filter, shown in figure 10, item 218 and described in paragraph 77).

11. On page 5, lines 10-12, the applicant argues for the novelty of the amended claim involving imposing a time delay of half a bit duration. While this was not present in Way's application, this amendment necessitated a new ground of rejection under Way in view of Napier as presented in this office action.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any response to this Office Action should be faxed to (571) 273-8300 or mailed to:

Commissioner for Patents,
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cody W. Lamb whose telephone number is (571)270-1797. The examiner can normally be reached on Monday - Friday 8 a.m. - 5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cody W. Lamb
Examiner, Art Unit 2613
8 February 2008



KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER